

## DECLARATION BY THE CANDIDATE

I, **RAJ KUMAR GUPTA**, certify that the work embodied in this thesis is my own bona fide work and carried out by me under the supervision of **Prof. L. P. SINGH** from **September 2012 to December 2017** at the **DEPARTMENT OF MATHEMATICAL SCIENCES**, Indian Institute of Technology (BHU), Varanasi. The matter embodied in this thesis has not been submitted for the award of any other degree/diploma. I declare that I have faithfully acknowledged and given credits to the research workers wherever their works have been cited in my work in this thesis. I further declare that I have not wilfully copied any other's work, paragraphs, text, data, results, *etc.*, reported in journals, books, magazines, reports dissertations, theses, *etc.*, or available at websites and have not included them in this thesis and have not cited as my own work.

Date: .....

Place: Varanasi

(RAJ KUMAR GUPTA)

## CERTIFICATE FROM THE SUPERVISOR

It is certified that the above statement made by the student is correct to the best of my/our knowledge.

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